DAVID GRISSOM SIGNATURE AMPS

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SEPTEMBER 23, 2013

DEVELOPMENT OVERVIEW

The David Grissom signature amps are the culmination of a 3+ year design collaboration that produced completely unique guitar amplifiers designed from the ground up to enhance and compliment David's playing style and needs. More than just amps narrowly focused for a specific player though, these amps are *very* versatile and can be used with many styles of music. In and studio or on the stage, David needs amps that can shift gears from sparkling cleans to heavy overdrive. At the beginning of the design process he had strong preferences for the richness, character of the tones, and interactive feel of the amp with his fingers. He was able to easily convey his amplifier performance desires quickly and accurately with some of his favorite "cherry-picked" vintage amps from his collection. The feel of the notes under his fingers and the richness of the tone, whether clean or distorted, were the prime objectives from day one. The resulting circuits, parts selection, and mechanical designs were a direct outflow of those objectives. Other considerations were how the low end performed and the character of the high end. "Sweet" high end examples on classic recordings were cited for my reference and the need for copious amount of available low end without sounding tubby or muddy was requested. I realized that David's playing style and expertise would allow me to get away with more low-end than usual because he has developed techniques to keep notes clear and un-modulated. This is a real luxury for an amp designer. And after we got the high end dialed in for him in his studio, it was tested in real-world situations and extensively recorded for further refinement and tweaking. David notes that he has never noticed anyone holding their ears or leaving due to biting treble during a gig. This is a testament to the balanced high end of the amps even at fairly loud volumes. Not stopping with just the tone and feel of the amps, we also designed the chassis and cabinets from the ground up with functional features that David wanted. Features like detachable power cords, finger-removable fuse holder accessible from the back panel, bias monitoring jacks and dual cooling fans were requested. In the end, the amps successfully embody the tone, performance, function, and aesthetic that we envisioned in the very beginning. It was a very enjoyable collaboration from start to finish with David, and I think the end results would not have been nearly as good if otherwise.

GETTING STARTED

It is important to carefully read the IMPORTANT SAFETY INSTRUCTIONS insert that was supplied with your product. Do this prior to operating your PRS amplifier.

Before turning the amplifier on:

- Connect the amplifier to an appropriate speaker cabinet or cabinets and select the correct ohm load from among the three options offered on the back of the amp. There are five total output jacks including two parallel 4 ohms, two parallel 8 ohms, and one 16 ohm. Multiple speaker cabinets will combine to create a "speaker load" that will be different from the individual cabinets. Combined parallel loads will be less than each speaker load individually. It is suggested to keep multiple loads equal in impedance- for example two 8 ohm cabinets (this would equal 4 ohms total) or two 16 ohm cabinets for 8 ohms total. Never plug into two different impedance jacks like a 4 ohm and an 8 ohm, only the appropriate jack and its parallel mate. For example again, connections of two 8 ohm cabinets would be made in the 4 ohm output jack and its associated extension jack. Always use a quality cable rated for speakers, not instruments.
- Connect the power cord to a grounded outlet of the voltage the amp indicates on the power inlet (120V for U.S., etc.). If you are unsure if your outlet is grounded, have it checked by an electrician or with an outlet checking device that can be purchased at a home

improvement store. Ungrounded or incorrectly wired outlets pose a number of issues, including serious shock danger and damage to your amplifier.

- Ensure that there is plenty of clearance around the chassis for the necessary air cooling required by the tubes and transformers. These amplifiers are designed to produce and shed more heat than others. The head cabinet design assists in the air cooling, being open in front behind the grill cloth to pull air through the center of the chassis through the tubes and out the back of the amp. There are two fans located on the back perforated grill, pulling air from the front of the amp out the back. Periodically check that these fans are functioning properly, and **in no case ever disconnect the fans**. Please provide a minimum 12" of clearance in front and behind the amp – noting that more clearance is always better.
- Turn the amplifier on using the power switch first. Allow the tubes to warm up for at least 60 seconds and then turn on the standby switch to use the amp. For extensive periods of time, it is recommended to turn off the power to the amp rather than leave the amp on standby.

DG CUSTOM 30 features and controls

Front panel controls and features include: 1) input jack, 2) bright switch, 3) volume, 4) reverb, 5) treble, 6) middle (midrange), 7) bass, 8) master (volume), and 9) power indicator light.
The back panel controls and features include: 1) power input module, 2) mains fuse holder, 3) B+ fuse holder, 4) power on switch, 5) standby switch, 6) bias test jack array, 7) boost/normal switch, 8) top cut control, 9) output jack array.
The **volume** controls the preamp gain and therefore much of the distortion. The gain structure is set up to achieve sustain of notes, even with clean settings. The **master volume** is a pre-phase inverter type, which affects preamp gain also. David uses the master volume to tailor his overall gain structure as much as reducing the overall volume of the amp for smaller venues. When adjusting it down very low, make other tone stack adjustments necessary to keep the tone similar to that at higher volumes. For higher distortion settings, run the volume knob up and the master volume down, just the opposite for cleaner settings. These settings in conjunction with the **"boost/normal" switch** in the back will allow quite a range of clean to overdrive tones. For those that prefer power amp distortion, both volume and master volume controls should be set high.
The **bright switch** is the type that bypasses the input to the output of the volume potentiometer with a small capacitor to add high-end chime at lower settings. David uses this switch in the "on" position along with the "normal" setting (un-boosted) for the back panel switch to achieve clean and shimmering yet warm tones. Tapped pickups further the ability to get bell-like tones. The higher the volume pot setting, the less the bypass capacitor will add high end to the signal.
The **presence and top cut controls** affect the power amp areas of the circuit and are useful in fine tuning the overall brightness of the amp. The presence control manipulates the negative feedback of the amp to add a different kind of treble to the tone, and the top cut dials in a phase cancellation of the highs to smooth in the treble sweetness to taste.
The **boost/normal switch** selects a different voltage division in a key gain stage to increase or decrease the guitar signal amplitude at that point. David uses the boost setting for general playing, and switches to normal for a cleaner studio tone. As stated before, he usually turns on the bright switch with the normal setting for extra sparkle.

DG CUSTOM 50 features and controls

The DG Custom 50 shares the controls of the 30 with the exception of the Presence, Top Cut, and Boost/Normal switches. This amp was designed to be a bit more straightforward and scaled down. The circuit, tubes, and voicing are less prone to need the extra tweaking with this amp as it was not designed as a larger scaled clone of the 30. The **master volume** is located in the circuit differently than on the 30. It is a post-phase-inverter master and allows for a touch more independence of the preamp distortion to the power amp distortion. In other words, the player can dial in preamp distortion with the volume control and the overall volume can be dialed down with the master without affecting the gain as much. So, lower volume distorted tones are more easily achieved with this type of master volume. The values of the master volume dual pot are carefully selected and adjusted to "completely disappear from the circuit" when turned up all the way. So, the values of the master turned to 10 equal the value of the circuit if there were no master volume at all.

TECHNICAL AND SERVICE NOTES

The following notes are intended to assist a qualified service technician and are for information only to the owner of the amplifier. **Amplifiers can contain hazardous stored electricity and pose dangers to the unqualified**. Tubes and transformers can become hot enough to cause burns. Please contact our customer service department with any questions regarding amplifier repair or modification.

TUBES

There are four **preamp tubes** in these amplifiers that are labeled V1 through V4. Looking at the tubes from the back of the amp, V1 is the preamp tube to the right. They are in a row behind the power tubes.

V1: ECC83S (aka 12AX7, CV4004) This is the first gain stages of the circuit.
V2: ECC81 (aka 12AT7) This tube drives the reverb circuit.
V3: ECC83S (12AX7, CV4004) This tube mixes the reverb and boosts the signal further.
V4: ECC83S (12AX7, CV4004) This is the phase inverter.

The **DG Custom 30 power tubes** are industrial/military grade EL84s known as 7189s and the Russian designation of 6P14P-EV. Do not use 7189A tubes, as they can have a different pin configuration. Also, the "-EV" designation on the Russian tubes is important as that indicates the tube with the correct specifications. The Russian tubes are readily available on eBay and other retail sources. They are also branded and sold as Sovtek EL84M tubes. This amplifier is designed for the extra ruggedness provided by these 7189 tubes, and it is not advisable to use regular EL84s.

The **DG Custom 50 power tubes** are EL34s. They ship with Winged "C" (aka SED) brand of tubes. We feel they produce a very vintage tone that rivals NOS.

The **rectifier tube** is a GZ34 (5AR4). We have tested the amp using the Sovtek brand, and it ships with this tube. Other brands of GZ34s have not been tested; use at your own risk. The DG 50 amp utilizes two of these rectifier tubes.

The **bias test jacks** allow for monitoring the power tubes to see if they are all working and are matched. Each tube has its own cathode resistor, so a tube failure will not affect the bias of any other power tube. Depending on the individual tube characteristics, they should indicate a bias of +/- 35 mA for the DG Custom 30 and +/- 67 mA for the DG Custom 50. To read the tube bias, set your meter to *millivolts*. The cathodes of the power tubes have a 1 ohm precision resistor in line with the cathode resistor to ground. Reading in millivolts across the 1 ohm resistor via the bias jacks will equal the current flowing through the tubes (Ohm's law). Tubes can be mismatched somewhat, but it is recommended to not vary more than 5 millivolts or so for tonal reasons.

The **DG Custom 30 mains fuse** is a 5mm x 20mm **3 amp** 250V slow blow fuse. The **DG Custom 30 B+ fuse** is a 5mm x 20mm **1 amp** fuse-- Littlelfuse #0477001.MXP is rated for 400 vdc and is recommended, but use 250 v minimum. Only replace any blown fuses with an exact fuse.

The **DG Custom 50 mains fuse** is a 5mm x 20mm **4 amp** 250V slow blow fuse. The **DG Custom 50 B+ fuse** is a 5mm x 20mm **1.5 amp** (250V minimum) slow blow fuse. Only replace any blown fuses with an exact fuse.

The **indicator light** is a 6.3V incandescent "#47" type with bayonet base. To install a new bulb, ensure the amp is unplugged and unscrew the jewel, push down on the top of the bulb (there is a spring making a compression fit) and rotate counter clockwise to free it from its base. It may be necessary to use a piece of tape to get enough friction to rotate the bulb. Reverse the process to install the new bulb. Take care not to improperly install the bulb in its base, as it could short 6.3 volts to the chassis and blow the mains fuse. The newly installed bulb should be straight and spaced evenly from the edges of the hole in the chassis (centered in the hole). Screw the jewel back on and check the light by turning on the power. If the bulb does not light, turn off the amp and inspect the installation carefully.

The **reverb pan** is a 3-spring, medium decay, short pan by Belton. The product number is: BS3AB2A1B. Reverb not working would most likely be a defective pan, reverb cables, or the 12AT7 reverb tube. Heavy shocks to the amplifier have been known to detach reverb springs and connecting wires in the reverb pan. The reverb cables can become dislodged also, so check these first before moving other possibilities. Since the reverb transformer likes to see a load, ensure that the reverb pan is connected properly before operating for extended periods of time.

Hum developing in the amp is most likely a preamp or power tube going bad. If the hum goes away when the master volume is turned down, then it is most likely V1, 2, or 3 since the master volume is located after these tubes. The technician can pull V1, check for hum and if none replace this tube and check to see if the hum is alleviated. If not, follow this procedure for V2 and 3. If the hum remains with the master volume on 0, replace the phase inverter tube (V4), and power tubes as necessary.

END OF TECH NOTES